

EUSTACHYS CARIBAEA (POACEAE: CHLORIDEAE) IN TEXAS—*Eustachys caribaea* (Sprengel) Herter, native to South America, is found in Argentina, Brasil, Paraguay, and Uruguay (Renvoize 1984). The first United States report was in Louisiana by McKenzie et al. (1987). Specimens of *E. caribaea* from Texas were first determined from material that had been misidentified as *E. retusa* at TAES. All Texas specimens of *Eustachys* were then examined from the following herbaria: BRIT/SMU, LL, MO, TEX, and US to find additional specimens of *E. caribaea* and to determine the status of other *Eustachys* in Texas.

Prior to this report of *E. caribaea*, only two species of *Eustachys* were reported to occur in Texas: *E. petraea* (Swartz) Desvaux and *E. retusa* (Lagasca) Kunth (Anderson 1975, Gould 1975, and Hatch et al. 1990). *Eustachys distichophylla* (Lagasca) Nees has been listed as occurring in Texas (Cory and Parks 1937, Chase 1951, and McKenzie et al. 1987). Chase (1951) reported examining a specimen of *E. distichophylla* from Bastrop County, Texas. Upon examining herbarium specimens, three specimens were found identified as *E. distichophylla* from Bastrop Co.; *Duval 385* (TEX), *Boys.n.* (TEX), and *Plonk 40* (US), which could have been examined by Chase. These specimens are *E. retusa* and not *E. distichophylla*. All Texas specimens identified as *E. distichophylla*, except for some that had been cultivated in experimental plots and nurseries, are *E. retusa*. Anderson (1975) reports that these two species can be readily confused. The two species can be distinguished by the following characters: *E. distichophylla* has a fertile (lowermost) floret 2.4 mm or longer, the sterile (uppermost) floret is oblanceolate, and the apex is obtuse to acute; whereas *E. retusa* has a fertile (lowermost) floret less than 2.4 mm long and the sterile (uppermost) floret is cuneate with a truncate apex. Since no specimen of *E. distichophylla* was found from Texas it was omitted from the key.

Superficially *E. caribaea* resembles *E. petraea* (when immature), and vegetatively all three species are similar. The following is a key to identify the species of *Eustachys* found in Texas. The species can be best differentiated by using mature specimens.

KEY TO *EUSTACHYS* OF TEXAS

1. Midvein (keel) of lowermost (fertile) lemma glabrous *E. retusa*
1. Midvein (keel) of lowermost (fertile) lemma pubescent 2
 2. Spikelets dark brown to black (light brown only when very immature); lowermost lemma margins glabrous on the lower 1/2 to 2/3, the upper part of the lemma margins with short usually appressed trichomes 0.1–0.4 mm long; uppermost (sterile) lemma 0.8–1.0(1.2) mm long *E. petraea*
 2. Spikelets pale to golden brown; lowermost lemma margins pubescent the entire length, trichomes on the lemma margins appressed to spreading, more than 0.5 mm long; uppermost (sterile) lemma 1.3–1.5 mm long *E. caribaea*

Eustachys caribaea has been referred to as *Chloris bahiensis* Steudel (Cabrera 1970, Rosengurtt et al. 1970), *C. capensis* (Houtt.) Thellung (Chase 1951, Burkart 1969) and *C. capensis* var. *bahiensis* (Steudel) L.R. Parodi (Burkart 1969). For a more indepth discussion on the nomenclature of this species see McKenzie et al. (1987).

DISTRIBUTION OF *EUSTACHYS CARIBAEA* IN TEXAS

Specimens examined. TEXAS. **Brazos Co.:** in the SW corner of the intersection of FR 2818 and FR 60 (W of College Station) on and around the Department of Rangeland Ecology and Management (Texas A&M University) barn and greenhouse compound; open pasture, 6 Nov 1970, *Cooper 46* (TAES); 28 Sep 1972, *Clark 762* (TAES); 16 Oct 1987, *Thompson 24* (TAES); 1 Oct 1990, *Wipff 1800, Hatch & Jones* (MO, PAUH, SMU, TAES, TEX, US, UTEP). **Caldwell Co.:** Corner Store, Luling, Gonzales Rd., sandy land, 18 Jul 1936, *Silveus 1440* (TEX). **Gonzales Co.:** Albert Barnes Ranch at Cheapside, Sep 1987, *Wright s.n.* (TAES). **Guadalupe Co.:** 6.7 mi S of Seguin, sandy roadside, 9 Apr 1955, *Shinners 19511* (SMU); Seguin, 14 Aug 1940, *Kellogg s.n.* (TEX). **Jackson Co.:** between Edna and Victoria, 21 Aug 1941, *B.C. Tharp 7210 & Silveus* (TEX).

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REFERENCES

- ANDERSON, D.E. 1975. *Eustachys*. pp. 333 – 335. In: Gould, F.W., The grasses of Texas. Texas A&M University Press, College Station. 653 pp.
- BURKART, A. 1969. Flora ilustrada de entre Rios (Argentina). parte II. Gramineas. Instituto Nacional de Tecnologia Agropecuaria, Buenos Aires (Argentina). 551 pp.
- CABRERA, A.L. 1970. Flora de la provincia de Buenos Aires. parte II. Gramineas. Instituto Nacional de Tecnologia Agropecuaria, Buenos Aires (Argentina). 624 pp.
- CHASE, A. 1951. Hitchcock's manual of the grasses of the United States, 2nd ed. U.S.D.A. Misc. Publ. no. 200. U.S. Government Printing Office, Washington, D.C. 1051 pp.
- CORY, V.L. and H.B. PARKS. 1937. Catalogue of the flora of the state of Texas. Texas Agric. Exp. Sta. Bull. No. 550. 130 pp.
- GOULD, F.W. 1975. Texas plants – a checklist and ecological summary. Texas Agric. Exp. Sta. Bull. MP-585. 121 pp.
- HATCH, S.L., K.N. GHANDI and L.E. BROWN. 1990. Checklist of the vascular plants of Texas. Texas Agric. Exp. Sta. Bull. MP-1655. 158 pp.
- MCKENZIE, P.M., L.E. URBATSCH and C. AULBACH-SMITH. 1987. *Eustachys caribaea* (Poaceae), a species new to the United States. Sida 12(1):227 – 232.

- RENVOIZE, S.A. 1984. The grasses of Bahia. Royal Botanic Gardens, Kew (London). 300 pp.
 ROSENGURTT, B., B.R. ARRILLAGA de MAFFEI and R. IZAGUIRRE de ARTUCIO. 1970. Gramineas Uruguayas. Universidad de la Republica, Uruguay. 490 pp.

ISOETES ENGELMANII (ISOETACEAE) AND *JUNCUS TRIGONOCARPUS* (JUNCACEAE) NEW TO ARKANSAS—A recent paper (Thomas et al. 1991) reported 32 taxa new to Arkansas. We herein report two additional species which can be considered as an addendum to this paper.

Smith (1988) lists two species of *Isoetes* in Arkansas: *I. butleri* Engelm. and *I. melanopoda* Gay & Dur. Both species possess tuberculate-walled megaspores. The reticulate-walled *I. engelmannii* A. Br. was recently discovered by Don Culwell in Cleburne County in north central Arkansas and the location reported to Eric Sundell and R. Dale Thomas.

Specimen collected: ARKANSAS. Cleburne Co.: alluvial soil, sand bars, and pools along Little Red River at the end of Ark. 210 at Cow Shoals E of Heber Springs and Ark. 110, 21 Oct 1990, Thomas, Sundell, & Amason 122,070 (NLU, SBSC).

Juncus trigonocarpus Steud. is an acid bog species ranging in the coastal plain from North Carolina S and W to E-central Texas. It was recently found by Carl Amason in Union County in south central Arkansas.

Specimen collected: ARKANSAS. Union Co.: very wet boggy area on electrical transmission high-line right-of-way NW of Hwy 167 and NE of Ark. 335, ca. 2.3 mi S of Calion, 4 Aug 1989, Thomas & Amason 111,678 (NLU, SBSC).

Among the rush species now reported for Arkansas only *J. trigonocarpus* Steud., *J. subcaudatus* (Engelm.) Cov. & Blake, and *J. canadensis* Gay ex Laharpe have seeds with tail-like membranous appendages. These appendages are as long or longer than the seed body in *J. canadensis* and *J. trigonocarpus*, while in *J. subcaudatus* the appendages are much shorter than the seed body. The mature capsule of *J. trigonocarpus* is much longer than the perianth and in *J. canadensis* the capsule and perianth are about equal in length or the capsule is slightly longer than the perianth.

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REFERENCES

- SMITH, E.B. 1988. An atlas and annotated list of the vascular plants of Arkansas. 2nd ed. Kinko's, 653 West Dickson, Fayetteville, AR 72701
 THOMAS, R.D., E.B. SMITH, E. SUNDELL, P. HYATT and C. AMASON. 1991. Additions to the flora of Arkansas. Sida 14:483 – 491.